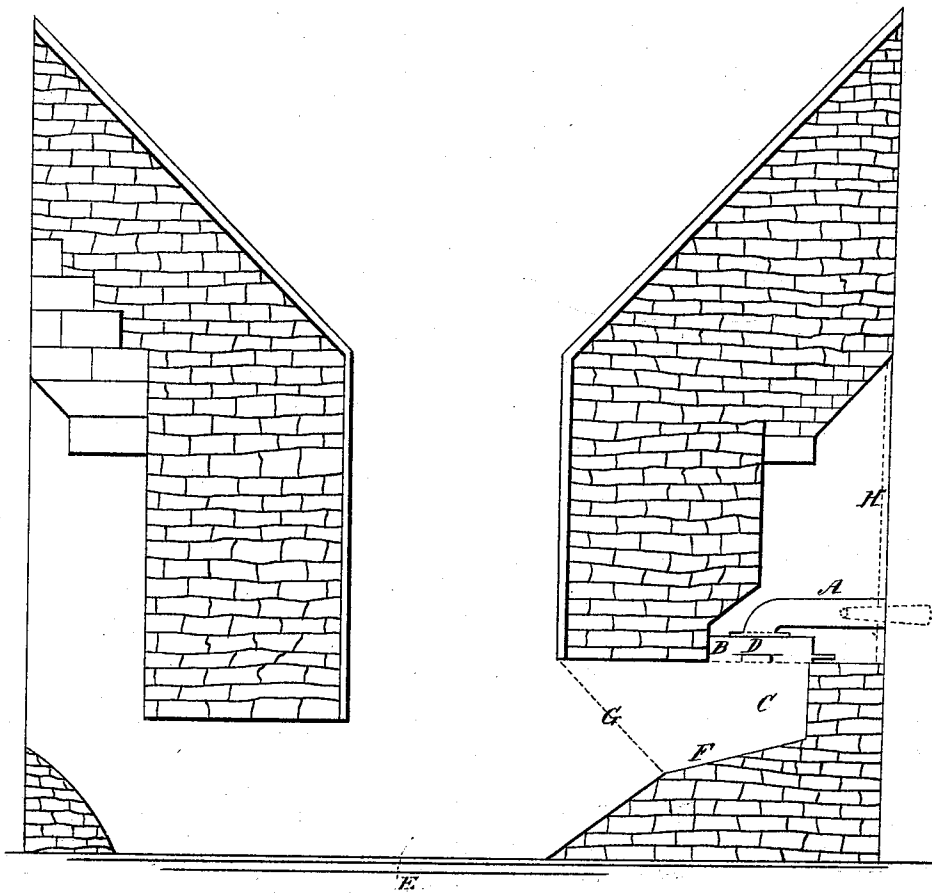


J. BARKER.  
Blast Furnace.

No. 172.

Patented Apr. 20, 1837.



# UNITED STATES PATENT OFFICE.

JOHN BARKER, OF BALTIMORE, MARYLAND.

## IMPROVEMENT IN THE MODE OF APPLYING THE BLAST TO FURNACES FOR THE SMELTING OR FUSING OF METALS.

Specification forming part of Letters Patent No. 172, dated April 20, 1837.

### *To all whom it may concern:*

Be it known that I, JOHN BARKER, of the city of Baltimore, in the State of Maryland, have invented a new and Improved Mode of Applying the Blast to Furnaces for the Smelting or Fusing of Metals, and which is particularly applicable to those erected for manufacturing of iron; and I do hereby declare that the following is a full and exact description thereof, reference being had to the drawing which accompanies and makes a part of this specification.

The drawing shows a section of an ordinary-sized smelting-furnace on a scale of an inch to a foot, and represents such part thereof as is necessary to a clear understanding of my invention, which consists in a mode of introducing the air from the blowing apparatus diffusely without impinging upon the ignited fuel, as it does when introduced through the tuyere in the ordinary way, by which diffusion there is an essential difference in the results produced, the action of the air being, from the very commencement of its introduction, by gradual and easy pressure.

A represents the blow-pipe connected with the blowing apparatus and passing through the tuyere-arch to the furnace. This pipe should not be less than three inches in diameter; but it may be made much larger, and its being so will rather aid than abstract from the results at which I aim. The quantity of air introduced through it is altogether independent of its size, this being governed by the number of strokes made by the piston and the capacity of the blowing apparatus. From the blow-pipe A the air passes into a square, round, or other shaped box, B, made of sheet or of cast iron, the horizontal section of which may be a square foot, (more or less,) and its depth about two inches. The lower part of this box is perforated with numerous holes, through which the air is to pass into the chamber C of the furnace, by which means the blast will enter over the whole area of the face of the plate. A small plate, D, may be placed directly under the blow-pipe, so as to diffuse the blast, or a similar result may be obtained by making the perforations about the middle of the lower plate much smaller than toward its outer edges. The bed-stone E may be continued in a horizontal position under the chamber C; but I

prefer to give it an inclination at that part as shown at F, as this will dispose any matter in fusion to descend toward the middle of the furnace. When this part is constructed, as shown in the drawing, the coal and other materials in the furnace as they descend will assume a position near the chamber C something like that shown by the dotted line G, leaving a clear space under the box B for the admission and expansion of the air, which will consequently be forced into the fuel by an equable pressure over a large surface, as intended by me. In the position given to the box B, also, there will be a perfect security against its being obstructed by the coal or other matter within the furnace. There may be two or more blow-pipes operating in the way described, just as there may be two or more tuyeres when the blast is introduced on the ordinary plan.

Instead of the box B, a trumpet-mouthed pipe may be used, as may also other analogous contrivances to diffuse the blast in the chamber, which diffusion is the great object that I have in view, and for this purpose my furnace must always be so constructed as to have a chamber operating like that marked C free from fuel through a space sufficient to allow a large surface to be exposed of that portion of the burning fuel into which the air from the blast is first to enter, which surface is represented by the dotted line G. In whatever way, therefore, the proper quantity of air is introduced, provided it be such as will allow of its diffusion in a chamber constructed so as to operate like that marked C before it comes into contact with the burning fuel, my purpose will be accomplished and my invention adopted. This may be done even when the blast is introduced into the chamber by the common blow-pipe, although it should be directed toward the burning fuel, as the chamber is intended to equalize the blast before its contact with the burning fuel. The chamber C, for example, may be extended in height by inclosing that part of the tuyere-arch shown by the dotted line H, and blowing into it by the ordinary blow-pipe, which would then occupy the place of the pipe A, as shown by the red lines I, the pipe A and the box D being removed.

Having thus fully described what I believe

to be the best mode of attaining the end which I propose—namely, the introduction of the blast into a furnace under an equable but comparatively light pressure by diffusing it at its entrance over a large surface without diminishing it in quantity—I do hereby declare that I do not intend to limit myself to any particular proportions or dimensions of the parts of my apparatus, or to any precise location thereof; but

I claim as my invention—

The diffusing of the blast in a chamber as it enters a furnace, in the manner and for the purpose herein set forth, whether the apparatus be constructed in the way described or in any other which is substantially the same.

JOHN BARKER.

Witnesses:

FRANCIS BARKER,  
HENRY I. BARKER.